REMARKS

Claims 7-19 are pending in the above identified application. The Examiner has rejected claims 7-19. Applicants have amended claims 7 and 11 in order to clarify the invention. This Preliminary Amendment is being filed with a Request for Continued Examination to insure entry and consideration.

The Examiner maintains the rejection of claims 7-9, 11-13, and 15-18 under 35 U.S.C. § 103 over applicant's admitted prior art (AAPA) in light of Miki and Possin. The Examiner further rejects claims 10, 14, and 19 over AAPA in light of Miki and Possin and additionally in view of one of ordinary skill in the art. Applicants herein traverse these rejections.

I. The prior art does not teach all of the elements of the claims

The prior art cited by the Examiner does not teach "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer that suppresses lateral leakage current over the first passivation layer," as is recited in claim 1 or "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer over the first passivation layer that suppresses lateral leakage current" as is recited in claim 11.

As the Examiner has admitted "the AAPA does not discuss using a second passivation layer overlying the first passivation layer to prevent the conducing channels from forming between two pixel electrodes" (Office Action, pgs 2-3). Therefore, the AAPA does not, as the Examiner admits, teach "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer that suppresses lateral leakage current over the first passivation layer," as is recited in claim 1 or "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a

second passivation layer over the first passivation layer that suppresses lateral leakage current" as is recited in claim 11. Miki does not cure the defects in the teachings of the AAPA.

As has been discussed before, Miki teaches deposition of a metal electrode over the TiO_2 layer, which is deposited on an interlayer insulator, and does not teach these layers deposited over the metal contacts. The structure shown in Figure 1 of Miki and the method of producing that structure illustrated in Figure 5(a) through 5(f) of Miki, therefore, does not teach "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer that suppresses lateral leakage current over the first passivation layer," as is recited in claim 1 or "depositing a first passivation layer over the plurality of source-drain metal contacts and the substrate; depositing a second passivation layer over the first passivation layer that suppresses lateral leakage current" as is recited in claim 11..

Furthermore, Possin fails to cure the defects in the teachings of the AAPA and Miki. Possin fails to disclose or suggest a second passivation layer to suppress lateral leakage current.

Claims 7 and 11 are therefore allowable over AAPA in view of Miki and Possin. Claims 8 through 10 depend from claim 7 and are therefore allowable over this art for at least the same reasons as is claim 7. Claims 12 through 19 depend from claim 11 and are therefore allowable for at least the same reasons as is claim 11.

II. There is no motivation to combine the AAPA and Miki.

There is no motivation to combine the AAPA teachings with the teachings of Miki as is suggested by the Examiner. Miki teaches away from "depositing a continuous layer of i a-Si disposed on the second passivation layer and the first doped a Si layer" as is recited in claim 7, or "depositing a continuous layer of i a-Si disposed on the second passivation layer and over the

first doped a-Si layer" as is recited in claim 11. Miki teaches that the increased insulation between capacitors in the array is not due to the thin TiO_2 layer that was deposited, but is a result of specific materials interactions between the TiO_2 layer and the subsequently deposited high-dielectric insulation layer. In particular, Miki explains that

> [t]he high-dielectric constant insulator deposited over the structure of FIG. 1 has a stoichiometric composition over the platinum and has a titanium-rich composition over the trench bottom. *The non-stoichiometric composition layer over the bottom, which is formed by reaction between the titanium oxide in the thin layer and lead in the high dielectric constant material, has a low dielectric constant and a high degree of insulation so that AC and DC electric insulation is effectively maintained between the adjacent electrodes.* Because of a low crystallinity, moreover, the layer formed has a planarized morphology.

(Miki, col. 3, lines 9-19) (emphasis added). Additionally, Miki is quite explicit about the combinations of materials that can be utilized in the invention of Miki and, in effect, teaches away from the layer combination (i.e.," "depositing a continuous layer of i a-Si disposed on the second passivation layer" as is recited in both claims 1 and 11) that is claimed in the present application. As is stated in Miki:

> Although foregoing embodiment used platinum as the electrode material, PZT as the high-dielectric-constant dielectric material, and titanium dioxide as the trench bottom material, the present invention can be practiced by changing the materials, as follows. The electrode material . . . . On the other hand, the high-dielectric-constant material can be effectively embodied by an oxide high-dielectric-constant material, as expressed in the following form: (A1A2 . . .) (B1B2 . . .)O_x (A1, A2 . . . =Ca, Sr, Cd, Ba, Pb, La, Bi, Tl, Na, K; and B1, B2 . . . =Ta, Ti, Zr, Hf, Fe, Nb, Sn, U, Al, Mn, W, Yb, Sc, U, In, Sb, Co, Zn, Li, Mo, Ni, Co), a material composed of these as a main component, or their mixture with another device. The trench bottom material can be embodied by a material composed with its main component of an oxide of the device, as recited by B1, B2, . . . indicated above.

(Miki, col. 6, line 63, to col. 7, line 17.) Miki, therefore, is extremely specific as to which dielectric materials are deposited on the second passivation layer. Amorphous silicon in any of its form is conspicuously absent from the list.

Therefore, Miki explicitly teaches that it matters a great deal what subsequent materials processing steps occur. Decidedly, the intrinsic amorphous silicon layer deposited on the second passivation layer in Applicants' invention is not one of the combinations mentioned in the teaching of Miki. Therefore, from the above discussion, Miki does not teach that the TiO_2 deposited layer suppresses lateral leakage current. Further, Miki teaches away from deposition of the i a-Si layer on the TiO_2 layer. The intrinsic amorphous silicon layer on a TiO_2 layer is not a combination of materials that is identified as beneficial by the teachings of Miki.

Additionally, modification of the teachings of Miki that allow deposition of the i a-Si layer on the TiO_2 layer would cause the invention of Miki to become inoperable. The benefits of the TiO_2 layer to Miki depends on the materials interaction between the high dielectric constant material deposited over the TiO_2 layer and the TiO_2 layer (or trench bottom material). As is stated in Miki,

> the undesirable coupling capacitance between the adjacent electrodes was only a few percent of the capacitance value between the bottom electrodes and the upper electrode, so that the undesirable electric coupling between adjacent bottom electrodes 104 was low. This is because the titanium dioxide and the PZT of the deposited layer reacted at the bottom of the trench to make a pyrochlore structure having a low dielectric constant and a high breakdown voltage and a mixture 603 between the former and the titanium oxide as shown in FIG. 6. It was found by an electric measurement that the dielectric had a dielectric constant of about 50 in this region 603.

(Miki, col. 6, lines 34-45). As discussed above, amorphous silicon is not a material recognized in Miki as providing or potentially providing such a reaction with the second passivation layer.

Therefore, the teachings of Miki indicate that the deposition of an i a Si layer over the second passivation layer, as is claimed in claims 7 and 11, would render the invention described in Miki inoperable for its intended purpose, i.e. providing a high dielectric material by material interaction between the layers.

Applicants further maintain that the Examiner is citing non-analogous art against the claims of the application. The structural and material differences between capacitor device structures and Applicants' full fill-factor imaging arrays are too different to expect one of ordinary skill in the art, even knowing of the teachings of Miki, to look to Miki for processes and structures that relate to a full-fill imaging array. It appears that the Examiner is utilizing impermissible hindsight in order to combine Miki with the AAPA.

As is discussed above, there is no motivation to combine Miki with the AAPA in the fashion suggested by the Examiner. As discussed, Miki teaches away from aspects of the invention claimed in claims 7 and 11. Furthermore, modification of Miki in the fashion suggested by the Examiner result in the invention of Miki becoming inoperable for its intended purpose. Therefore, Applicants respectfully request that the Examiner reconsider the rejections of claims 7 through 19 based on this art.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: June 30, 2004

By: _____
Gary J. Edwards
Reg. No. 41,008

EXPRESS MAIL LABEL NO.
EV 533068931 US